

# PATENT ABSTRACTS OF JAPAN

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## (54) PHOTOSENSITIVE RESIN COMPOSITION

### (57)Abstract:

PROBLEM TO BE SOLVED: To obtain a photosensitive resin composition superior in adhesion to a substrate and enhanced in etching resistance in forming a circuit pattern for a liquid crystal panel and a printed circuit board and the like by incorporating a compound having a specified unit in the molecule.

**SOLUTION:** This photosensitive resin composition exposable to active rays and developable in an aqueous solution of alkali contains the compound having a carboxylic acid dianhydride unit and a carboxylic acid unit and/or a carboxylate ester in one molecule, and it is preferred that the compound having the carboxylic acid dianhydride unit mixed with one of (1) a positive photosensitive resin composition comprising an alkali-soluble resin, and a quinonediazidosulfonate, and (2) a chemically sensitized negative photosensitive resin composition comprising an alkali-soluble resin and an acid photogenerator and a cross-linking agent is used.

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#### CLAIMS

## [Claim(s)]

[Claim 1] (A) The photopolymer constituent which is characterized by containing the compound which has at least one carboxylic-acid 2 anhydride unit, the carboxylic-acid unit of at least one (B) (b), and/or the carboxylate unit of at least one (b) in intramolecular and in which development with an alkali water solution is possible.

[Claim 2] The photopolymer constituent according to claim 1 with which said photopolymer constituent contains alkali fusibility resin and a quinone diazide sulfonate compound.

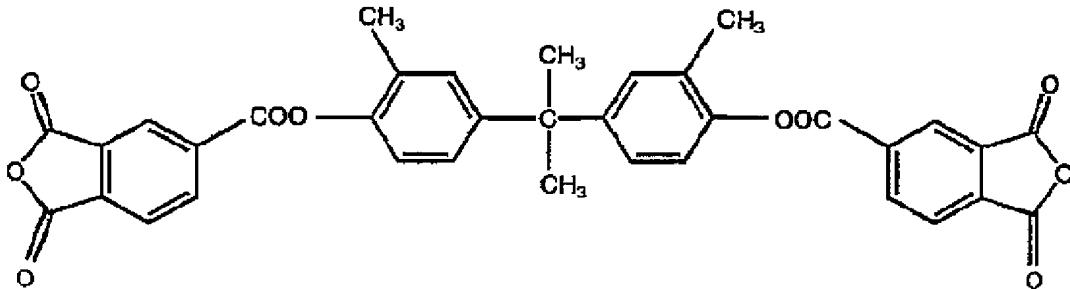
[Claim 3] The photopolymer constituent according to claim 1 with which said photopolymer constituent contains alkali fusibility resin, a photo-oxide generating agent, and a cross linking agent.

[Claim 4] The photopolymer constituent according to claim 1 with which said photopolymer constituent contains alkali fusibility resin, a photopolymerization nature monomer, and a photopolymerization initiator.

[Claim 5] A photopolymer constituent given in any 1 term of claims 1–4 which come to blend the compound which has the aforementioned (A) component and the (B) component in intramolecular at a rate of 0.1 – 15 weight section to the total amount 100 weight section of a photopolymer constituent.

[Claim 6] A photopolymer constituent given in any 1 term of claims 1–5 whose compound which has the aforementioned (A) component and the (B) component in intramolecular is trimellitic anhydride or a trimellitic anhydride ester compound.

[Claim 7] the compound which has the aforementioned (A) component and the (B) component in intramolecular — \*\* 1 — [Formula 1]



The photopolymer constituent according to claim 6 which is a compound come out of and expressed.

[Claim 8] A photopolymer constituent given in any 1 term of claims 1–7 which come as a solvent to contain at least one sort chosen from methyl lactate, ethyl lactate,

lactic-acid propyl, lactic-acid isopropyl, and butyl lactate in said photopolymer constituent.

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## DETAILED DESCRIPTION

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### [Detailed Description of the Invention]

[0001]

[Field of the Invention] About the photopolymer constituent which induces activity beams of light, such as far ultraviolet rays containing ultraviolet rays, an excimer laser, etc., in more detail, in circuit pattern formation of a liquid crystal panel, a printed wired board, etc., this invention is excellent in adhesion with a substrate, and relates to the good photopolymer constituent of etching-proof nature.

[0002]

[Description of the Prior Art] In manufacture of a liquid crystal panel, a semiconductor device, a magnetic-bubble-memory component, etc. Form a copper circuit pattern, the transparency electric conduction film, a layer insulation layer, or various metal vacuum evaporation film on a substrate, on it, apply a photopolymer constituent, prepare a photoresist layer, and exposure exposure of the activity beam of light is carried out alternatively at this photoresist layer. An alkali water solution removes the exposure part of a photoresist layer alternatively, wet or dry etching processing is performed to some or all of a substrate that was exposed further, a resist pattern is formed, and pattern formation of the transparency electric conduction film or a metal membrane is performed for this resist pattern as a mask.

[0003] However, when the photopolymer constituent used conventionally was applied to glass substrates, such as such a liquid crystal panel, etc., adhesion with a substrate was not enough, the etching reagent entered between the resist pattern and the substrate at the time of etching processing, and the resist pattern might separate partially and might be disconnected. Moreover, in the resist pattern formation by the positive type photoresist, the amount of [ of the non-irradiated section of an activity beam of light ] management of a photoresist layer separated thinly in tabular at the time of development, the reattachment was carried out to the substrate floated and exposed into the developer, this caused poor etching, and there were problems, such as causing a short circuit.

[0004] On the other hand, although proposed about amelioration of a photopolymer constituent in JP,4-31860,A, JP,6-43637,A, JP,6-348017,A, etc., it has come to solve

that development residue arises etc. even to extent which may still be satisfied enough.

[0005] Moreover, although the gestalt of various display devices, such as a stagger mold, a reverse stagger mold, a coplanar mold, and a reverse coplanar mold, is proposed if it is in the TFT mold liquid crystal panel which attracts attention in recent years, generally the laminating of Si membrane layer, the SiN layer, etc. is carried out to many layers on a transparency glass substrate, and pattern formation of the gate electrode is usually carried out to these maximum upper layer. This gate electrode consisted of a tantalum, chromium, molybdenum, aluminum, or these alloys, and the photopolymer constituent which can bear the mixed-acid etching reagent for etching these metals was not found out until now.

[0006]

[Problem(s) to be Solved by the Invention] This invention was made in view of the above-mentioned situation, especially, in circuit pattern formation of a liquid crystal panel, a printed wired board, etc., is excellent in adhesion with a substrate, and presupposes that it aims at offering the photopolymer constituent which may raise etching-proof nature.

[0007]

[Means for Solving the Problem] this invention persons came to complete this invention for the above-mentioned technical problem being solvable based on a header and this by making the compound which has a specific unit in the photopolymer constituent in which development is possible with an alkali water solution at intramolecular that it can expose with an activity beam of light contain, as a result of repeating research wholeheartedly, in order to solve the above-mentioned technical problem.

[0008] That is, this invention relates to the photopolymer constituent in which development is possible with the alkali water solution characterized by containing the compound which has the carboxylic-acid unit of at least one (A) (B) (b), and/or the carboxylate unit of at least one (b) in intramolecular with at least one carboxylic-acid 2 anhydride unit.

[0009]

[Embodiment of the Invention] This invention is explained in full detail below.

[0010] As a photopolymer constituent in which development is possible, with the alkali water solution of this invention (i) Alkali fusibility resin, the positive type photopolymer constituent which comes to contain a quinone diazide sulfonate compound, (ii) The chemistry magnification negative-mold photopolymer constituent which comes to

contain alkali fusibility resin, a photo-oxide generating agent, and a cross linking agent, (iii) or [ the photopolymerization mold photopolymer constituent which comes to contain alkali fusibility resin, a photopolymerization nature monomer, and a photopolymerization initiator, and \*\*\*\*\* ] -- (A) -- with at least one carboxylic-acid 2 anhydride unit (B) What blended the compound which has the carboxylic-acid unit of at least one (b) and/or the carboxylate unit of at least one (b) in intramolecular is used preferably.

[0011] The photopolymer constituent which blended the compound which has the above (A) and the (B) component in (i) positive type photopolymer constituent and (ii) chemistry magnification negative-mold photopolymer constituent at intramolecular especially is excellent in adhesion with a substrate, since etching-proof nature is not only good, but can use it as the photopolymer of high sensitivity comparatively, it is used preferably, and it is (i) positive type photopolymer constituent especially preferably.

[0012] As the above-mentioned alkali fusibility resin, novolak resin, an acrylic linear polymer, and its derivative are mentioned as an example.

[0013] Novolak resin A phenol, o-cresol, m-cresol, P-cresol, 2, 3-xylenol, 2, 5-xylenol, 3, 4-xylenol, 3,5-xylenol, 3, 6-xylenol, 2 and 3, a 4-trimethyl phenol, 3, 4, a 5-trimethyl phenol, 2-tert-butylphenol, 3-tert-butylphenol, 4-tert-butylphenol, Resorcinol, 2-methyl resorcinol, a catechol, 4-methylcathecol, 3-methoxy phenol, gallic-acid methyl, gallic-acid ethyl, 4-ethylphenol, 4-propyl phenol, 4-isopropyl phenol, o-methyl phenol, It can obtain by carrying out the addition polymerization of the formaldehyde, such as formaldehyde, a paraformaldehyde, an acetaldehyde, a propyl aldehyde, and a benzaldehyde, to phenols, such as m-methyl phenol and p-methyl phenol. The novolak resin which contained m-cresol and p-cresol especially can be preferably used from having the engine performance which was excellent in respect of sensibility, development nature, and preservation stability.

[0014] As an acrylic linear polymer, for example Moreover, an acrylic acid, a methacrylic acid, a crotonic acid, a maleic acid, a phthalic acid, a fumaric acid, an itaconic acid, etc., A methyl acrylate, a methyl methacrylate, an ethyl acrylate, ethyl methacrylate, 2-hydroxyethyl acrylate, 2-hydroxyethyl methacrylate, 2-hydroxypropyl methacrylate, n-butyl acrylate, N-butyl methacrylate, an isobutyl bitter taste lied, isobutyl methacrylate, That to which the copolymer of benzyl acrylate, benzyl methacrylate, phenoxy acrylate, phenoxy methacrylate, isobornyl acrylate, isobornyl methacrylate, styrene, acrylamide, the acrylonitrile, etc. was carried out is mentioned. Bridge formation effectiveness can be raised by having an acryloyl radical

and a methacryloyl radical in resin.

[0015] This alkali fusibility resin has the desirable thing of the weight average molecular weight 2,000-100,000 which cut the low-molecular field, and it is 5,000-80,000 more preferably. When weight average molecular weight is too low, it may be deficient in film organization potency, film decrease may become intense at the time of development, on the other hand, when too high, developing time may turn into long duration, and it may have a bad influence on a substrate.

[0016] As a quinone diazide sulfonate compound used by this invention, especially if it may be used as a photosensitive component, it is not limited, and the esterification object of the naphthoquinones -1, such as a naphthoquinone -1, a 2-diazido-4-sulfonic acid, a naphthoquinone -1, and a 2-diazido-5-sulfonic acid, 2-diazide sulfonyl halide, and a hydroxy compound etc. is used preferably. Specifically The naphthoquinone -1 of 2, 3, and 4-trihydroxy benzophenone, a 2-diazido-4-sulfonate, The naphthoquinone -1 of 2, 3, and 4-trihydroxy benzophenone, a 2-diazido-5-sulfonate, The naphthoquinone -1 of 2, 4, and 6-trihydroxy benzophenone, a 2-diazido-4-sulfonate, The naphthoquinone -1 of 2, 4, and 6-trihydroxy benzophenone, a 2-diazido-5-sulfonate, etc., ester compound;2 of a trihydroxy benzophenone, and a naphthoquinone -1 and 2-diazido sulfonic acid, 2', 4, and 4' — the naphthoquinone -1 of a — tetra-hydroxy benzophenone, and a 2-diazido-4-sulfonate — 2, 2', 4, and 4' — the naphthoquinone -1 of a — tetra-hydroxy benzophenone, and a 2-diazido-5-sulfonate — The naphthoquinone -1 of a 2, 3, 4, and 3'-tetra-hydroxy benzophenone, a 2-diazido-4-sulfonate, The naphthoquinone -1 of a 2, 3, 4, and 3'-tetra-hydroxy benzophenone, a 2-diazido-5-sulfonate, The naphthoquinone -1 of a 2, 3, 4, and 4'-tetra-hydroxy benzophenone, a 2-diazido-5-sulfonate, The naphthoquinone -1 of a 2, 3, 4, and 2'-tetra-hydroxy benzophenone, a 2-diazido-4-sulfonate, The naphthoquinone -1 of a 2, 3, 4, and 2'-tetra-hydroxy benzophenone, a 2-diazido-5-sulfonate, The naphthoquinone -1 of 2, 3, 4, and 4'- tetrapod hydroxy-3'-methoxybenzophenone, a 2-diazido-5-sulfonate, etc., The ester compound of a tetra-hydroxy benzophenone, and a naphthoquinone -1 and 2-diazido sulfonic acid; 2, 3, 4, 2', the naphthoquinone -1 of a 4'-pentahydroxy benzophenone, a 2-diazido-4-sulfonate, 2, 3, 4, 2', the naphthoquinone -1 of a 4'-pentahydroxy benzophenone, a 2-diazido-5-sulfonate, 2, 3, 4, 2', the naphthoquinone -1 of a 6'-pentahydroxy benzophenone, a 2-diazido-4-sulfonate, 2, 3, 4, 2', the naphthoquinone -1 of a 6'-pentahydroxy benzophenone, a 2-diazido-5-sulfonate, etc.,

ester compound;2 of a pentahydroxy benzophenone, and a naphthoquinone -1 and 2-diazido sulfonic acid, 4 and 6, 3', 4', and 5 — ' — the naphthoquinone -1 of - hexa hydroxy benzophenone, and a 2-diazido-4-sulfonate — 2, 4, 6, 3', 4', and 5 — ' — the naphthoquinone -1 of - hexa hydroxy benzophenone, and a 2-diazido-5-sulfonate — 3, 4, 5, 3', 4', and 5 — ' — the naphthoquinone -1 of - hexa hydroxy benzophenone, and a 2-diazido-4-sulfonate — 3, 4, 5, 3', 4', and 5 — ' — with hexa hydroxy benzophenones, such as the naphthoquinone -1 of - hexa hydroxy benzophenone, and a 2-diazido-5-sulfonate A naphthoquinone -1, an ester compound with 2-diazido sulfonic acid; The naphthoquinone -1 of 2 and 2'-dihydroxy diphenylmethane, a 2-diazido-4-sulfonate, The naphthoquinone -1 of 2 and 2'-dihydroxy diphenylmethane, a 2-diazido-5-sulfonate, The naphthoquinone -1 of 2 and 4'-dihydroxy diphenylmethane, a 2-diazido-4-sulfonate, The naphthoquinone -1 of 2 and 4'-dihydroxy diphenylmethane, a 2-diazido-5-sulfonate, The naphthoquinone -1 of 4 and 4'-dihydroxy diphenylmethane, a 2-diazido-4-sulfonate, The naphthoquinone -1 of 4 and 4'-dihydroxy diphenylmethane, a 2-diazido-5-sulfonate, etc., Dihydroxy diphenylmethane, a naphthoquinone -1, the naphthoquinone -1 of ester compound;1-(2-hydroxyphenyl)-1-(2'-hydroxyphenyl) ethane with 2-diazido sulfonic acid, a 2-diazido-4-sulfonate, The naphthoquinone -1 of 1-(2-hydroxyphenyl)-1-(2'-hydroxyphenyl) ethane, a 2-diazido-5-sulfonate, The naphthoquinone -1 of 1-(2-hydroxyphenyl)-1-(4'-hydroxyphenyl) ethane, a 2-diazido-4-sulfonate, the naphthoquinone -1 of 1-(2-hydroxyphenyl)-1-(4'-hydroxyphenyl) ethane, 2-diazido -5 - A sulfonate, the naphthoquinone -1 of 1-(4-hydroxyphenyl)-1-(4'-hydroxyphenyl) ethane, a 2-diazido-4-sulfonate, The naphthoquinone -1 of 1-(4-hydroxyphenyl)-1-(4'-hydroxyphenyl) ethane, a 2-diazido-5-sulfonate, The naphthoquinone -1 of 1-phenyl-1-(2, 4-dihydroxy phenyl) ethane, a 2-diazido-4-sulfonate, The naphthoquinone -1 of 1-phenyl-1-(2, 4-dihydroxy phenyl) ethane, a 2-diazido-5-sulfonate, The naphthoquinone -1 of 1-phenyl-1-(2, 6-dihydroxy phenyl) ethane, a 2-diazido-5-sulfonate, The naphthoquinone -1 of 1-(2-hydroxyphenyl)-2-(2'-hydroxyphenyl) ethane, a 2-diazido-4-sulfonate, The naphthoquinone -1 of 1-(2-hydroxyphenyl)-2-(2'-hydroxyphenyl) ethane, a 2-diazido-5-sulfonate, The naphthoquinone -1 of 1-(2-hydroxyphenyl)-2-(4'-hydroxyphenyl) ethane, a 2-diazido-4-sulfonate, The naphthoquinone -1 of 1-(2-hydroxyphenyl)-2-(4'-hydroxyphenyl) ethane, a 2-diazido-5-sulfonate, The



2-diazido-4-sulfonate, The naphthoquinone -1 of a 1-phenyl-2-(2, 4-dihydroxy phenyl) propane, a 2-diazido-5-sulfonate, The naphthoquinone -1 of a 2-phenyl-1-(2, 4-dihydroxy phenyl) propane, a 2-diazido-4-sulfonate, The naphthoquinone -1 of the naphthoquinone -1 of a 2-phenyl-1-(2, 4-dihydroxy phenyl) propane, a 2-diazido-5-sulfonate, and a 1-phenyl-2-(2, 6-dihydroxy phenyl) propane, 2-diazido-4-sulfo The naphthoquinone -1 of N acid ester and a 1-phenyl-2-(2, 6-dihydroxy phenyl) propane, a 2-diazido-5-sulfonate, The naphthoquinone -1 of a 2-phenyl-1-(2, 6-dihydroxy phenyl) propane, a 2-diazido-4-sulfonate, The naphthoquinone -1 of a 2-phenyl-1-(2, 6-dihydroxy phenyl) propane, a 2-diazido-5-sulfonate, The naphthoquinone -1 of a 2-(2-hydroxyphenyl)-2-(2'-hydroxyphenyl) propane, a 2-diazido-4-sulfonate, The naphthoquinone -1 of a 2-(2-hydroxyphenyl)-2-(2'-hydroxyphenyl) propane, a 2-diazido-5-sulfonate, The naphthoquinone -1 of a 2-(2-hydroxyphenyl)-2-(4'-hydroxyphenyl) propane, a 2-diazido-4-sulfonate, The naphthoquinone -1 of a 2-(2-hydroxyphenyl)-2-(4'-hydroxyphenyl) propane, a 2-diazido-5-sulfonate, The naphthoquinone -1 of a 2-(4-hydroxyphenyl)-2-(4'-hydroxyphenyl) propane, a 2-diazido-4-sulfonate, The naphthoquinone -1 of a 2-(4-hydroxyphenyl)-2-(4'-hydroxyphenyl) propane, a 2-diazido-5-sulfonate, The naphthoquinone -1 of a 2-phenyl-2-(2, 4-dihydroxy phenyl) propane, a 2-diazido-4-sulfonate, The naphthoquinone -1 of a 2-phenyl-2-(2, 4-dihydroxy phenyl) propane, a 2-diazido-5-sulfonate, The naphthoquinone -1 of a 2-phenyl-2-(2, 6-dihydroxy phenyl) propane, a 2-diazido-4-sulfonate, The naphthoquinone -1 of a 2-phenyl-2-(2, 6-dihydroxy phenyl) propane, a 2-diazido-5-sulfonate, The naphthoquinone -1 of a 1-(2-hydroxyphenyl)-3-(2'-hydroxyphenyl) propane, a 2-diazido-4-sulfonate, The naphthoquinone -1 of a 1-(2-hydroxyphenyl)-3-(2'-hydroxyphenyl) propane, a 2-diazido-5-sulfonate, The naphthoquinone -1 of a 1-(2-hydroxyphenyl)-3-(4'-hydroxyphenyl) propane, a 2-diazido-4-sulfonate, The naphthoquinone -1 of a 1-(2-hydroxyphenyl)-3-(4'-hydroxyphenyl) propane, a 2-diazido-5-sulfonate, The naphthoquinone -1 of a 1-(4-hydroxyphenyl)-3-(4'-hydroxyphenyl) propane, a 2-diazido-4-sulfonate, The naphthoquinone -1 of a 1-(4-hydroxyphenyl)-3-(4'-hydroxyphenyl) propane, a 2-diazido-5-sulfonate, The naphthoquinone -1 of a 1-phenyl-3-(2, 4-dihydroxy phenyl) propane, a 2-diazido-4-sulfonate, The naphthoquinone -1 of a 1-phenyl-3-(2, 4-dihydroxy phenyl) propane, a 2-diazido-5-sulfonate, The naphthoquinone -1 of a 1-phenyl-3-(2, 6-dihydroxy phenyl) propane, a 2-diazido-4-sulfonate, The

naphthoquinone -1 of a 1-phenyl-3-(2, 6-dihydroxy phenyl) propane, a 2-diazido-5-sulfonate, etc., ester compound; 2 of a dihydroxy phenyl propane, and a naphthoquinone -1 and 2-diazido sulfonic acid, 2', and 2' -- ' -- the naphthoquinone -1 of - trihydroxy triphenylmethane color, and a 2-diazido-4-sulfonate -- 2, 2', the naphthoquinone -1 of a 2"-trihydroxy triphenylmethane color, a 2-diazido-5-sulfonate, 2, 2', the naphthoquinone -1 of a 4"-trihydroxy triphenylmethane color, a 2-diazido-4-sulfonate, 2, 2', the naphthoquinone -1 of a 4"-trihydroxy triphenylmethane color, a 2-diazido-5-sulfonate, 2, 4', the naphthoquinone -1 of a 4"-trihydroxy triphenylmethane color, a 2-diazido-4-sulfonate, 2, 4', the naphthoquinone -1 of a 4"-trihydroxy triphenylmethane color, a 2-diazido-5-sulfonate, 4, 4', the naphthoquinone -1 of a 4"-trihydroxy triphenylmethane color, a 2-diazido-4-sulfonate, 4, 4', the naphthoquinone -1 of a 4"-trihydroxy triphenylmethane color, a 2-diazido-5-sulfonate, 2, 2', the naphthoquinone -1 of 2"-trihydroxy triphenyl ethane, a 2-diazido-4-sulfonate, 2, 2', the naphthoquinone -1 of 2"-trihydroxy triphenyl ethane, a 2-diazido-5-sulfonate, 2, 2', the naphthoquinone -1 of 4"-trihydroxy triphenyl ethane, a 2-diazido-4-sulfonate, 2, 2', the naphthoquinone -1 of 4"-trihydroxy triphenyl ethane, a 2-diazido-5-sulfonate, 2, 4', the naphthoquinone -1 of 4"-trihydroxy triphenyl ethane, a 2-diazido-5-sulfonate, 2, 4', the naphthoquinone -1 of 4"-trihydroxy triphenyl ethane, a 2-diazido-5-sulfonate, 4, 4', the naphthoquinone -1 of 4"-trihydroxy triphenyl ethane, a 2-diazido-4-sulfonate, 4, 4', the naphthoquinone -1 of 4"-trihydroxy triphenyl ethane, a 2-diazido-5-sulfonate, 2, 2', the naphthoquinone -1 of a 2"-trihydroxy triphenyl propane, a 2-diazido-4-sulfonate, 2, 2', and 2' -- proper [ 'naphthoquinone / of - trihydroxy triphenyl propane / -1, 2-diazido-5-sulfonate, 2, 2', 4"-trihydroxy triphenyl ] the naphthoquinone -1 of N, a 2-diazido-4-sulfonate, 2, 2', and 4' -- ' -- the naphthoquinone -1 of - trihydroxy triphenyl propane, and a 2-diazido-5-sulfonate -- 2, 4', the naphthoquinone -1 of a 4"-trihydroxy triphenyl propane, a 2-diazido-4-sulfonate, 2, 4', the naphthoquinone -1 of a 4"-trihydroxy triphenyl propane, a 2-diazido-5-sulfonate, 4, 4', the naphthoquinone -1 of a 4"-trihydroxy triphenyl propane, a 2-diazido-4-sulfonate, 4, 4', the naphthoquinone -1 of a 4"-trihydroxy triphenyl propane, a 2-diazido-5-sulfonate, The naphthoquinone -1 of 4-[1 and 1-dimethyl-1-(o-hydroxymethyl) phenyl]-bis(o-hydroxyphenyl) methane, a 2-diazido-4-sulfonate, The naphthoquinone -1 of 4-[1 and 1-dimethyl-1-(o-hydroxymethyl) phenyl]-bis(o-hydroxyphenyl) methane, a 2-diazido-5-sulfonate, The naphthoquinone -1 of 4-[1 and

1-dimethyl-1-(o-hydroxymethyl) phenyl]-bis(p-hydroxyphenyl) methane, a 2-diazido-4-sulfonate, The naphthoquinone -1 of 4-[1 and 1-dimethyl-1-(o-hydroxymethyl) phenyl]-bis(p-hydroxyphenyl) methane, a 2-diazido-5-sulfonate, The naphthoquinone -1 of 4-[1 and 1-dimethyl-1-(p-hydroxymethyl) phenyl]-bis(o-hydroxyphenyl) methane, a 2-diazido-4-sulfonate, The naphthoquinone -1 of 4-[1 and 1-dimethyl-1-(p-hydroxymethyl) phenyl]-bis(o-hydroxyphenyl) methane, a 2-diazido-5-sulfonate, The naphthoquinone -1 of 4-[1 and 1-dimethyl-1-(p-hydroxymethyl) phenyl]-bis(p-hydroxyphenyl) methane, a 2-diazido-4-sulfonate, The naphthoquinone -1 of 4-[1 and 1-dimethyl-1-(p-hydroxymethyl) phenyl]-bis(p-hydroxyphenyl) methane, a 2-diazido-5-sulfonate, The naphthoquinone -1 of [4-(o-hydroxy phenylmethyl) phenyl]-bis(o-hydroxyphenyl) methane, a 2-diazido-4-sulfonate, The naphthoquinone -1 of [4-(o-hydroxy phenylmethyl) phenyl]-bis(o-hydroxyphenyl) methane, a 2-diazido-5-sulfonate, The naphthoquinone -1 of [4-(o-hydroxy phenylmethyl) phenyl]-bis(o-hydroxyphenyl) methane, a 2-diazido-4-sulfonate, The naphthoquinone -1 of [4-(o-hydroxy phenylmethyl) phenyl]-bis(p-hydroxyphenyl) methane, a 2-diazido-5-sulfonate, The naphthoquinone -1 of [4-(o-hydroxy phenylmethyl) phenyl]-bis(p-hydroxyphenyl) methane, a 2-diazido-5-sulfonate, The naphthoquinone -1 of [4-(p-hydroxy phenylmethyl) phenyl]-bis(o-hydroxyphenyl) methane, a 2-diazido-4-sulfonate, The naphthoquinone -1 of [4-(p-hydroxy phenylmethyl) phenyl]-bis(o-hydroxyphenyl) methane, a 2-diazido-5-sulfonate, The naphthoquinone -1 of [4-(p-hydroxy phenylmethyl) phenyl]-bis(o-hydroxyphenyl) methane, a 2-diazido-4-sulfonate, The naphthoquinone -1 of [4-(p-hydroxy phenylmethyl) phenyl]-bis(p-hydroxyphenyl) methane, a 2-diazido-5-sulfonate, The naphthoquinone -1 of 1-[4-[1 and 1-dimethyl-1-(o-hydroxyphenyl) methyl] phenyl]-1 and 1-bis(o-hydroxyphenyl) ethane, a 2-diazido-4-sulfonate, The naphthoquinone -1 of 1-[4-[1 and 1-dimethyl-1-(o-hydroxyphenyl) methyl] phenyl]-1 and 1-bis(o-hydroxyphenyl) ethane, a 2-diazido-5-sulfonate, The naphthoquinone -1 of 1-[4-[1 and 1-dimethyl-1-(o-hydroxyphenyl) methyl] phenyl]-1 and 1-bis(p-hydroxyphenyl) ethane, a 2-diazido-4-sulfonate, The diazido-5-sulfonate of 1-[4-[1 and 1-dimethyl-1-(o-hydroxyphenyl) methyl] phenyl]-1 and 1-bis(p-hydroxyphenyl) ethane-1,2-naphthoquinone, The naphthoquinone -1 of 1-[4-[1 and 1-dimethyl-1-(p-hydroxyphenyl) methyl] phenyl]-1 and 1-bis(o-hydroxyphenyl) ethane, a 2-diazido-4-sulfonate, The naphthoquinone -1 of 1-[4-[1 and 1-dimethyl-1-(p-hydroxyphenyl) methyl] phenyl]-1 and 1-bis(o-hydroxyphenyl) ethane, a 2-diazido-5-sulfonate, The naphthoquinone -1 of 1-[4-[1 and

1-dimethyl-1-(p-hydroxyphenyl) methyl] phenyl]-1 and 1-bis(p-hydroxyphenyl) ethane, a 2-diazido-4-sulfonate, The naphthoquinone -1 of 1-[4-[1 and 1-dimethyl-1-(p-hydroxyphenyl) methyl] phenyl]-1 and 1-bis(p-hydroxyphenyl) ethane, a 2-diazido-5-sulfonate, The naphthoquinone -1 of 1-[4-(o-hydroxy phenylmethyl) phenyl]-1 and 1-bis(o-hydroxyphenyl) ethane, a 2-diazido-4-sulfonate, The naphthoquinone -1 of 1-[4-(o-hydroxy phenylmethyl) phenyl]-1 and 1-bis(o-hydroxyphenyl) ethane, a 2-diazido-5-sulfonate, The naphthoquinone -1 of 1-[4-(o-hydroxy phenylmethyl) phenyl]-1 and 1-bis(p-hydroxyphenyl) ethane, 2-diazido-4 - The naphthoquinone -1 of sulfonate, 1-[4-(o-hydroxy phenylmethyl) phenyl]-1, and 1-bis(p-hydroxyphenyl) ethane, a 2-diazido-5-sulfonate, The naphthoquinone -1 of 1-[4-(p-hydroxy phenylmethyl) phenyl]-1 and 1-bis(o-hydroxyphenyl) ethane, a 2-diazido-4-sulfonate, The naphthoquinone -1 of 1-[4-(p-hydroxy phenylmethyl) phenyl]-1 and 1-bis(o-hydroxyphenyl) ethane, a 2-diazido-5-sulfonate, The naphthoquinone -1 of 1-[4-(p-hydroxy phenylmethyl) phenyl]-1 and 1-bis(p-hydroxyphenyl) ethane, a 2-diazido-4-sulfonate, The naphthoquinone -1 of 1-[4-[1 and 1-dimethyl-1-(o-hydroxyphenyl) methyl] phenyl]-2 and 2-bis(o-hydroxyphenyl) ethane, a 2-diazido-4-sulfonate, The naphthoquinone -1 of 1-[4-[1 and 1-dimethyl-1-(o-hydroxyphenyl) methyl] phenyl]-2 and 2-bis(o-hydroxyphenyl) ethane, a 2-diazido-5-sulfonate, The naphthoquinone -1 of 1-[4-[1 and 1-dimethyl-1-(o-hydroxyphenyl) methyl] phenyl]-2 and 2-bis(p-hydroxyphenyl) ethane, a 2-diazido-4-sulfonate, The naphthoquinone -1 of 1-[4-[1 and 1-dimethyl-1-(o-hydroxyphenyl) methyl] phenyl]-2 and 2-bis(p-hydroxyphenyl) ethane, a 2-diazido-5-sulfonate, The naphthoquinone -1 of 1-[4-[1 and 1-dimethyl-1-(p-hydroxyphenyl) methyl] phenyl]-2 and 2-bis(o-hydroxyphenyl) ethane, a 2-diazido-4-sulfonate, The naphthoquinone -1 of 1-[4-[1 and 1-dimethyl-1-(p-hydroxyphenyl) methyl] phenyl]-2 and 2-bis(o-hydroxyphenyl) ethane, a 2-diazido-5-sulfonate, The naphthoquinone -1 of 1-[4-[1 and 1-dimethyl-1-(p-hydroxyphenyl) methyl] phenyl]-2 and 2-bis(p-hydroxyphenyl) ethane, a 2-diazido-4-sulfonate, The naphthoquinone -1 of 1-[4-(o-hydroxy phenylmethyl) phenyl]-2 and 2-bis(o-hydroxyphenyl) ethane, a 2-diazido-5-sulfonate, The naphthoquinone -1 of 1-[4-(o-hydroxy phenylmethyl) phenyl]-2 and 2-bis(o-hydroxyphenyl) ethane, a 2-diazido-4-sulfonate, The

naphthoquinone -1 of 1-[4-(o-hydroxy phenylmethyl) phenyl]-2 and 2-bis(p-hydroxyphenyl) ethane, a 2-diazido-4-sulfonate, The naphthoquinone -1 of 1-[4-(o-hydroxy phenylmethyl) phenyl]-2 and 2-bis(p-hydroxyphenyl) ethane, a 2-diazido-5-sulfonate, The naphthoquinone -1 of 1-[4-(p-hydroxy phenylmethyl) phenyl]-2 and 2-bis(o-hydroxyphenyl) ethane, a 2-diazido-4-sulfonate, The naphthoquinone -1 of 1-[4-(p-hydroxy phenylmethyl) phenyl]-2 and 2-bis(o-hydroxyphenyl) ethane, a 2-diazido-5-sulfonate, The naphthoquinone -1 of 1-[4-(p-hydroxy phenylmethyl) phenyl]-2 and 2-bis(p-hydroxyphenyl) ethane, a 2-diazido-4-sulfonate, The naphthoquinone -1 of 1-[4-(p-hydroxy phenylmethyl) phenyl]-2 and 2-bis(p-hydroxyphenyl) ethane, a 2-diazido-5-sulfonate, etc. are mentioned.

[0017] These may be used independently or may be used combining two or more sorts. In addition, as for the rate of esterification, in the naphthoquinonediazide sulfonate of the above hydroxy compounds used by this invention, it is desirable that it is about 30 - 100 % of the weight. It can ask for the rate of esterification by [(number of naphthoquinonediazide sulfonate radical mols) /(number of hydroxy group mols before esterification of hydroxy compound)] x100.

[0018] This naphthoquinonediazide sulfonate is 15 - 80 weight section preferably [ blending at a rate of the 5 - 150 weight section to said alkali fusibility resin 100 weight section ], and more preferably. If there are too few loadings, sensibility may fall, poor development may be caused, and on the other hand, if there are too many loadings, since etching-proof nature falls [ paint film nature ] in admiration \*\*, it is not desirable.

[0019] It is not what will be limited as an acid generator used by this invention especially if an acid is generated directly or indirectly by light. Specifically A diphenyliodonium salt, a triphenylsulfonium salt, phenyl diazonium salt, Benzyl tosylate, nitrobenzyl tosylate, dinitro benzyl tosylate, Benzyl sulfonate, nitrobenzyl sulfonate, benzyl cull BONETO, Nitrobenzyl cull BONETO, dinitro benzyl cull BONETO, s-triazine, 2, 4-Bisto RIKURORO methyl-6-(4-methoxy) phenyl-s-triazine, 2, 4-Bisto RIKURORO methyl-6-(4-methoxy) styryl-s-triazine, etc. are used.

[0020] This acid generator is 1.1 - 20 weight section preferably [ making it blend at a rate of 0.01 - 50 weight section to the alkali fusibility resin 100 weight section ], and more preferably. Since pattern formation will become difficult if loadings are too low, Society for Cutting Up Men will be generated on the other hand if there are too many loadings, and development nonuniformity occurs, it is not desirable.

[0021] As a cross linking agent used for this invention, a urea, alkoxy methylation

melamine resin, an alkoxy methylation urea-resin, etc. are mentioned as a suitable thing, for example. After making a melamine or a urea react with formalin for example, in an ebullition water solution and obtaining a condensate, these alkoxy methylation amino resin can make this able to etherify with lower alcohol, such as methyl alcohol, ethyl alcohol, propyl alcohol, butyl alcohol, and isopropyl alcohol, and can be prepared by taking out the resin which subsequently cools reaction mixture and deposits. As an example of alkoxy methylation amino resin, methoxymethyl-ized melamine resin, ethoxy methylation melamine resin, propoxy methylation melamine resin, butoxy methylation melamine resin, a methoxymethyl-ized urea-resin, an ethoxy methylation urea-resin, a propoxy methylation urea-resin, a butoxy methylation urea-resin, etc. are mentioned. These may be used independently and may be used combining two or more sorts. In said alkoxy methylation amino resin, especially an alkoxy methylation urea-resin is desirable, and the stable resist pattern with the especially small amount of dimensional changes of the resist pattern to change of the dose of a radiation can be obtained by using this.

[0022] A cross linking agent is 3 – 60 weight section preferably [ blending at a rate of the 1 – 100 weight section to the alkali fusibility resin 100 weight section ], and more preferably.

[0023] As a photopolymerization nature monomer used for this invention An acrylic acid, a methacrylic acid, a fumaric acid, a maleic acid, fumaric-acid monomethyl, Fumaric-acid monoethyl, 2-hydroxyethyl acrylate, 2-hydroxyethyl methacrylate, Ethylene-glycol-monomethyl-ether acrylate, ethylene-glycol-monomethyl-ether methacrylate, Ethylene-glycol-monoethyl-ether acrylate, ethylene-glycol-monoethyl-ether methacrylate, Glycerol acrylate, glycerol methacrylate, an acrylic-acid amide, A methacrylic-acid amide, acrylonitrile, a methacrylonitrile, methyl acrylate, Methyl methacrylate, ethyl acrylate, ethyl methacrylate, Isobutyl acrylate, isobutyl methacrylate, 2-ethylhexyl acrylate, Monofunctional monomers, such as 2-ethylhexyl methacrylate, benzyl acrylate, and benzyl methacrylate; Ethylene glycol diacrylate, Ethylene glycol dimethacrylate, triethylene glycol diacrylate, Triethylene glycol dimethacrylate, tetraethylene glycol diacrylate, Tetraethylene glycol dimethacrylate, butylene-glycol dimethacrylate, Propylene glycol diacrylate, propylene glycol dimethacrylate, Trimethylolpropane triacrylate, trimethylolpropanetrimethacrylate, Tetramethylolpropanetetraacrylate, tetramethylolpropane tetra methacrylate, A pentaerythritol thoria chestnut rate, pentaerythritol trimethacrylate, Pentaerythritol tetraacrylate, pentaerythritol tetra-methacrylate, Dipentaerythritol pentaacrylate, dipentaerythritol

pentamethacrylate, Polyfunctional monomer, such as dipentaerythritol hexaacrylate, dipentaerythritol hexamethacrylate, 1,6-hexanediol diacrylate, 1, 6-hexanedioldimethacrylate, and cardo epoxy diacrylate, etc. can be used.

[0024] A photopolymerization nature monomer is 10 – 75 weight section preferably [ blending at a rate of the 5 – 100 weight section to the alkali fusibility resin 100 weight section ], and more preferably.

[0025] As a photopolymerization initiator used by this invention, 1-hydroxy cyclohexyl phenyl ketone, 2 and 2-dimethoxy -1, 2-bibenzyl-1-ON, 2-methyl-1-[4-(methylthio) phenyl]-2-morpholinopropane-1-ON, 2-benzyl-2-dimethylamino -1 -(4-morpholino phenyl)- Butane-1-ON, 2-hydroxy - 2-methyl-1-phenyl propane-1-ON, 2 and 4, 6-trimethyl benzoyl diphenyl phosphine oxide, 1-[4-(2-hydroxy ethoxy) phenyl]-2-hydroxy-2-methyl-1-propane-1-ON, 2, 4-diethyl thioxan ton, 2-chloro thio KINTON, 2, 4-dimethyl thioxan ton, 3 and 3-dimethyl-4-methoxybenzophenone, a benzophenone, A 1-chloro-4-propoxy thioxan ton, 1-(4-isopropyl phenyl)-2-hydroxy-isobutane-1-ON, 1-(4-dodecyl phenyl)-2-hydroxy-isobutane-1-ON, A 4-benzoyl-4'-methyl dimethyl sulfide, 4-dimethylamino benzoic acid, 4-dimethylamino methyl benzoate, 4-dimethylamino ethyl benzoate, 4-dimethylamino benzoic-acid butyl, 4-dimethylamino benzoic-acid-2-ethylhexyl, 4-dimethylamino benzoic-acid-2-isoamyl, 2, and 2-diethoxy acetophenone, Benzyl dimethyl ketal, a benzyl-beta-methoxy ethyl acetal, The 1-phenyl -1, a 2-propane dione-2-(o-ethoxycarbonyl) oxime, Methyl o-benzoylbenzoate, a bis(4-dimethylamino phenyl) ketone, A – screw diethylamino benzophenone, and 4 and 4 '4, 4'-dichloro benzophenone, Benzyl, a benzoin, benzoin methyl ether, benzoin ethyl ether, Benzoin iso-propyl ether, benzoin-n-butyl ether, Benzoin isobutyl ether, benzoin butyl ether, p-dimethylamino acetophenone, p-tert-BUCHIRUTORI chloroacetophenone, a p-tert-butyl dichloro acetophenone, A thioxan ton, 2-methylthio xanthone, 2-isopropyl thioxan ton, dibenzosulfone, alpha, and alpha-dichloro-4-phenoxy acetophenone, pentyl-4-dimethylamino benzoate, etc. can be mentioned.

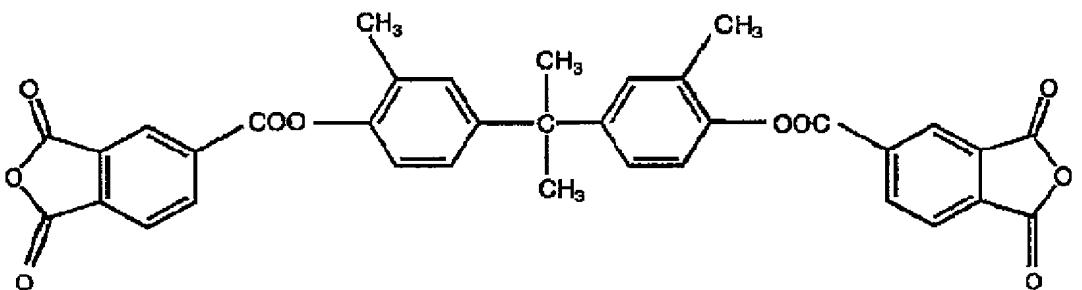
[0026] A photopolymerization initiator is 0.5 – 10 weight section preferably [ blending at a rate of 0.1 – 20 weight section to the alkali fusibility resin 100 weight section ], and more preferably.

[0027] In this invention, it is characterized by making the compound which has the carboxylic-acid unit of at least one (A) (B) (b), and/or the carboxylate unit of at least one (b) in the above-mentioned photopolymer constituent with at least one carboxylic-acid 2 anhydride unit further at intramolecular contain.

[0028] By adding the compound which has the above (A) and the (B) component in intramolecular, the adhesion of a photopolymer constituent and a substrate can be raised, peeling of an etching reagent depended for sinking in is prevented beforehand, it is lost that an exfoliation object moreover carries out the reattachment to a substrate at the time of development, and development nonuniformity does not occur. The resistance which was especially excellent to the mixed-acid etching reagent used in case refractory metals, such as a tantalum, chromium, and a molybdenum-tantalum, are etched at the time of gate electrode formation of a TFT-liquid-crystal panel is shown.

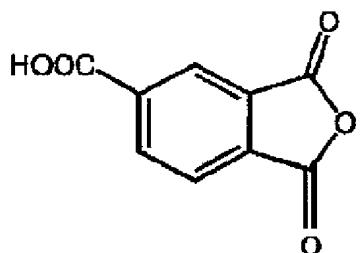
[0029] As a compound which has the above (A) and the (B) component in intramolecular, especially trimellitic acid or a trimellitic acid ester compound can be used suitably. Specifically, they are following \*\* 2 --izing 9 [0030].

[Formula 2]



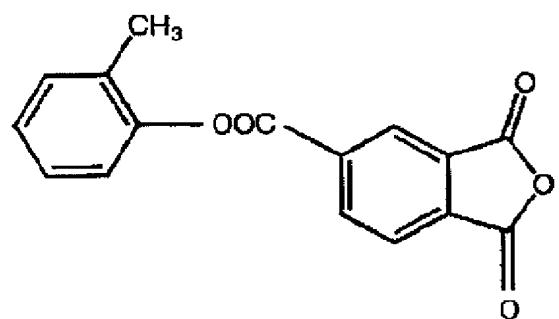
[0031]

[Formula 3]



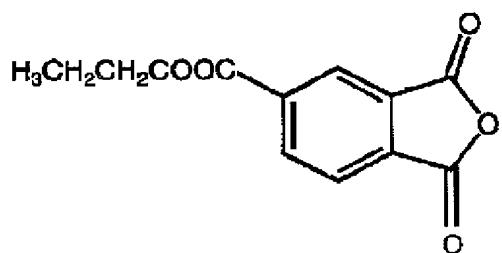
[0032]

[Formula 4]



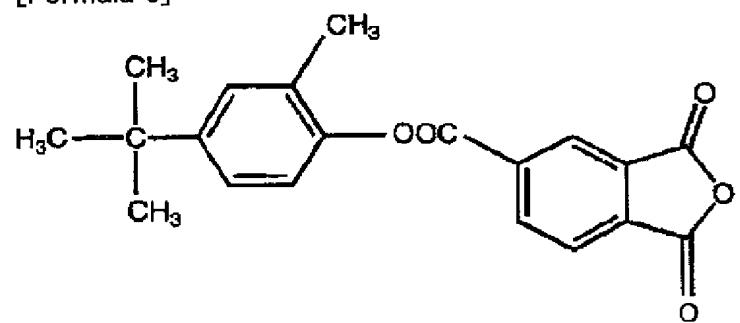
[0033]

[Formula 5]



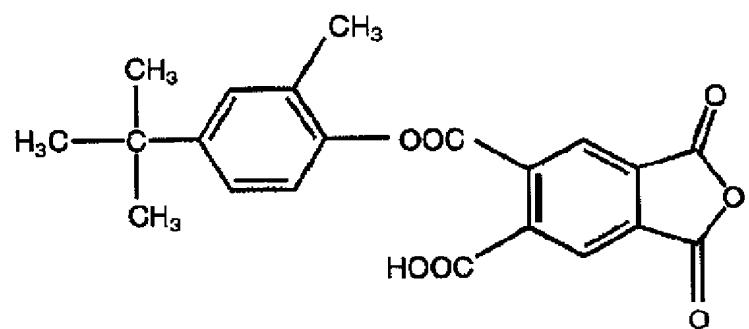
[0034]

[Formula 6]



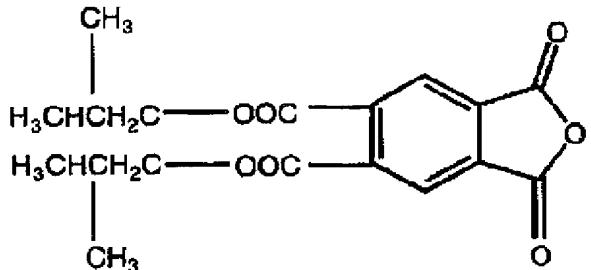
[0035]

[Formula 7]



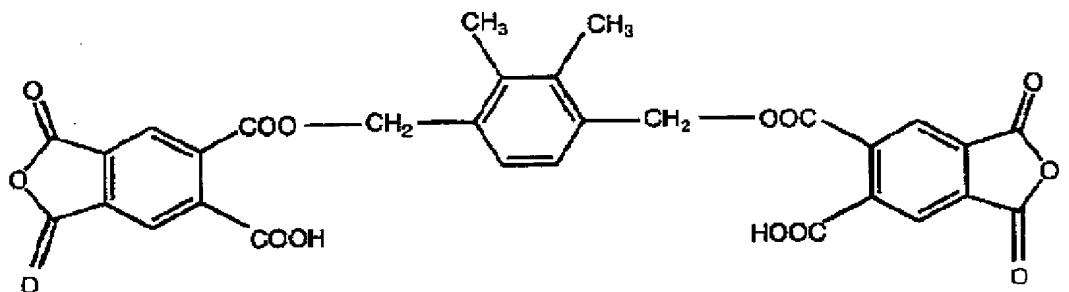
[0036]

[Formula 8]



[0037]

[Formula 9]



Although it comes out and the compound expressed is mentioned in instantiation, the compound expressed with the above-ization 2 especially is used especially preferably.

[0038] (A) And the compound which has the (B) component in intramolecular is 0.4 – 10 weight section preferably [ blending at a rate of 0.1 – 15 weight section to the total amount 100 weight section of the photopolymer constituent which blended the compound which has \*\* (A) and the (B) component in intramolecular ], and more preferably. Under in the 0.1 weight section, when it is difficult to acquire the effectiveness of this invention and it exceeds 15 weight sections on the other hand, sensibility may fall.

[0039] The suitable operation of this invention photopolymer constituent applies and dries with a spinner etc. the solution which dissolved in the solvent the photopolymer constituent which blended the compound which has (A) and the (B) component on a substrate first at intramolecular, for example, and is taken as a resist layer. As a substrate, they are the glass substrate with which transparency electric conduction film, such as ITO film, was prepared, the glass-epoxy resin laminated sheet with which the copper circuit pattern was covered. An activity beam of light is irradiated through

a necessary mask pattern after desiccation using a low pressure mercury lamp, a high pressure mercury vapor lamp, an ultrahigh pressure mercury lamp, a chemical lamp, an excimer laser generator, etc. If it is in a positive type photopolymer constituent among resist layers by this, the molecular structure of a quinone diazide sulfonate compound changes in the part by which the activity beam of light was irradiated, and it becomes very meltable to an alkali water solution. Moreover, if it is in a chemistry magnification mold photopolymer constituent and a photopolymerization mold photopolymer constituent, an activity beam of light becomes meltable [ a non-irradiated part ] in an alkali water solution. Then, dissolution removal of the part which solubilized this by exposure when immersed in the developer is carried out alternatively, and a resist pattern faithful to a mask pattern can be obtained.

[0040] As the above-mentioned developer, the hydroxide of alkali metal, such as a lithium, sodium, and a potassium, Primary amine, such as a carbonate, a bicarbonate, phosphate, pyrophosphate; benzylamine, and a butylamine; Dimethylamine, Secondary amine, such as dibenzylamine and diethanolamine; A trimethylamine, Tertiary amine, such as triethylamine and triethanolamine; A morpholine, Annular amines, such as a piperazine and a pyridine; Polyamine; tetraethylammonium hydroxide, such as ethylenediamine and a hexamethylenediamine, Ammonium hydroxide, such as trimethyl benzyl ammonium hydroxide and trimethyl phenyl benzyl ammonium hydroxide; Trimethylsulfonium hydroxide, Sulfonium hydroxide, such as diethylmethylsulfonium hydroxide and dimethylbenzylsulfonium hydroxide; in addition to this, 1 – 10-% of the weight water solutions, such as a choline, etc. are used.

[0041] Subsequently, by using the obtained resist pattern as a mask, etching processing is performed and patterning of the substrate is carried out. After pattern formation, with a strong-base water solution with a pH [ of a sodium hydroxide a potassium hydroxide, etc. ] of 13 or more about etc., a resist pattern exfoliates and can be removed.

[0042] As a solvent for dissolving the photopolymer constituent of this invention Ethylene glycol monomethyl ether, ethylene glycol monoethyl ether, The ethylene glycol monopropyl ether, ethylene glycol monobutyl ether, Ethylene glycol wood ether, ethylene glycol diethylether, Ethylene glycol dipropyl ether, propylene glycol monomethyl ether, The propylene glycol monoethyl ether, the propylene glycol monopropyl ether, The propylene glycol monobutyl ether, propylene glycol wood ether, Propylene glycol diethylether, the diethylene-glycol monomethyl ether, Diethylene glycol monoethyl ether, the diethylene-glycol monophenyl ether, Diethylene-glycol wood ether, diethylene-glycol diethylether, Ethylene glycol monomethyl ether acetate,

ethylene glycol monoethyl ether acetate, Ethylene glycol monopropyl ether acetate, ethylene-glycol-monobutyl-ether acetate, Ethylene-glycol-monophenyl-ether acetate, diethylene-glycol monomethyl ether acetate, Diethylene glycol monoethyl ether acetate, diethylene-glycol monopropyl ether acetate, Diethylene glycol monobutyl ether acetate, diethylene-glycol monophenyl ether acetate, Propylene-glycol-monomethyl-ether acetate, propylene glycol monoethyl ether acetate, Propylene glycol monopropylether acetate, 2-methoxy butyl acetate, 3-methoxy butyl acetate, 4-methoxy butyl acetate, 2-methyl-3-methoxy butyl acetate, 3-methyl-3-methoxy butyl acetate, 3-ethyl-3-methoxy butyl acetate, 2-ethoxy butyl acetate, 4-ethoxy butyl acetate, 4-propoxy butyl acetate, 2-methoxy pentyl acetate, 3-methoxy pentyl acetate, 4-methoxy pentyl acetate, 2-methyl-3-methoxy pentyl acetate, 3-methyl-3-methoxy pentyl acetate, 3-methyl-4-methoxy pentyl acetate, 4-methyl-4-methoxy pentyl acetate, an acetone, a methyl ethyl ketone, a diethyl ketone and methyl -- a beefsteak plant -- a butyl ketone and an ethyl isobutyl ketone -- A tetrahydrofuran, a cyclohexanone, methyl propionate, ethyl propionate, Propionic-acid propyl, propionic-acid isopropyl, 2-hydroxy methyl propionate, 2-hydroxy ethyl propionate, 2-hydroxy-2-methyl, Methyl-3-methoxy propionate, ethyl-3-methoxy propionate, Ethyl-3-ethoxy propionate, ethyl-3-propoxy propionate, Propyl-3-methoxy propionate, isopropyl-3-methoxy propionate, Ethoxy ethyl acetate, oxy-ethyl acetate, 2-hydroxy-3-methyl butanoic acid methyl, Methyl acetate, ethyl acetate, propyl acetate, isopropyl acetate, butyl acetate, Isoamyl acetate, methyl carbonate, ethyl carbonate, carbonic acid propyl, carbonic acid butyl, Methyl pyruvate, pyruvic-acid ethyl, pyruvic-acid propyl, pyruvic-acid butyl, Methyl acetoacetate, an ethyl acetoacetate, benzyl methyl ether, benzyl ethyl ether, Dihexyl ether, benzyl acetate, ethyl benzoate, oxalic acid diethyl, A diethyl maleate, gamma-butyrolactone, benzene, toluene, a xylene, A cyclohexanone, a methanol, ethanol, propanol, a butanol, a hexanol, a cyclohexanol, ethylene glycol, a diethylene glycol, a glycerol, methyl lactate, ethyl lactate, lactic-acid propyl, lactic-acid isopropyl, butyl lactate, etc. are mentioned. This solvent that what carried out 30-90 weight section content has high preservation stability, and can use preferably methyl lactate, ethyl lactate, lactic-acid propyl, lactic-acid isopropyl, and butyl lactate into the solvent component 100 weight section especially can be preferably combined at a rate below the 1000 weight sections below the 2000 weight sections to the total amount 100 weight section of the photopolymer constituent which blended the compound which has (A) and the (B) component in intramolecular.

[0043] In the photopolymer constituent of this invention, a sensitizer, a plasticizer, a surfactant, a defoaming agent, and other additives can be added further if needed.

[0044] As a sensitizer, specifically Eosine B (C. I.No.45400) Eosine J (C. I.No.45380), alcoholic fusibility eosine (C. I.No.45386), SHIANOSHIN (C. I.No.45410), Bengal Lowe's, erythrosine (C. I.No.45430), 2, 3, 7-trihydroxy-9-phenyl xanthene-6-ON, And xanthene coloring matter, such as rhodamine 6G; The thionine (C. I.No.52000), Thiazine dye, such as AZUREA (C. I.No.52005) and AZURE C (C. I.No.52002); Pyronin B (C. I.No.45005) And pyronin coloring matter, such as Pyronin GY (C. I.No.45005); coumarin compounds, such as 3-acetyl coumarin and a 3-acetyl 7-diethylamino coumarin, etc. are mentioned.

[0045] As a plasticizer, dioctyl phthalate, didodecyl phthalate, triethylene glycol dicaprylate, dimethyl glycol phthalate, tricresyl phosphate, dioctyl adipate, dibutyl sebacate, a thoria cetyl glycerol, etc. are mentioned.

[0046] As a surface active agent, the various activators of an anion system, a cation system, and the Nonion system are mentioned.

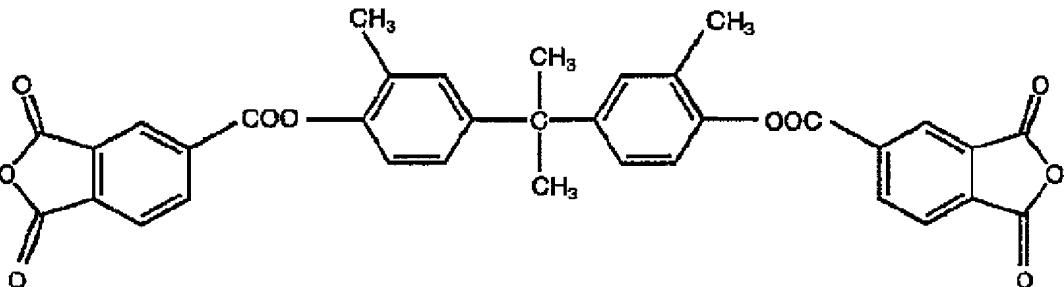
[0047] As a defoaming agent, a silicone system, fluorine system various defoaming agents, etc. are mentioned.

[0048]

[Example] Although this invention is explained based on an example below, this invention range is not limited at all by this.

[0049] (Example 1 of preparation) They are one mol of 2, 3, 4, and 4'-tetra-hydroxy benzophenones, and a naphthoquinone to the cresol novolak resin (weight average molecular weight 7,500 [ about ]) 75 weight section which mixed m-cresol and p-cresol by the weight ratio 60:40, added formaldehyde to this under existence of an oxalic acid catalyst, and was manufactured with the conventional method. – 1, the two mols [ of 2-diazido-5-sulfonyl chloride ] esterification resultant 24 weight section, following-izing 10 [0050]

[Formula 10]



[0051] After having come out, adding the compound 1 weight section expressed, the ethyl lactate 100 weight section, and the propylene-glycol-monomethyl-ether acetate 60 weight section and dissolving, this was filtered with the 0.2-micrometer membrane filter, and the photopolymer constituent was prepared.

[0052] (Example 2 of preparation) In the example 1 of preparation, the photopolymer constituent was prepared like the example 1 of preparation except having not added the compound expressed with the above-ization 10.

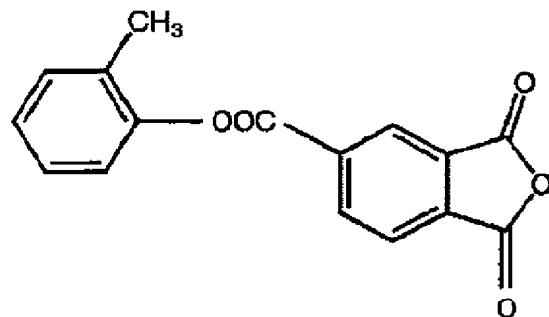
[0053] (Example 3 of preparation) In the example 1 of preparation, the photopolymer constituent was prepared like the example 1 of preparation except having added the trimellitic acid 0.3 weight section instead of the compound 1 weight section expressed with the above-ization 10.

[0054] m-cresol and p-cresol are mixed by the weight ratio 20:80. (Example 4 of preparation) In the cresol novolak resin (weight average molecular weight 7,500 [ about ]) 60 weight section which added formaldehyde to this under existence of an oxalic acid catalyst, and was manufactured with the conventional method 2 The 4-Bisto RIKURORO methyl-6-(4-methoxy) phenyl-s-triazine 10 weight section, The N-methoxy methylol melamine 29 weight section, the lactic-acid isopropyl 75 weight section, the ethylene-glycol-monomethyl-ether 75 weight section, and the trimellitic acid 1 weight section were added, and the photopolymer constituent was prepared.

[0055] (Example 5 of preparation) In the example 1 of preparation, the photopolymer constituent was prepared like the example 1 of preparation except having made into the 12.5 weight sections the addition of the compound expressed with the above-ization 10.

[0056] (Example 6 of preparation) It is the following-ization 11 [0057] instead of the compound 1 weight section which adds the methacrylic-acid / methyl-methacrylate / benzyl acrylate =20/60/20 copolymer (weight average molecular weight 45,000 [ about ]) 60 weight section instead of the cresol novolak resin 60 weight section in the example 1 of preparation, and is further expressed with the above-ization 10.

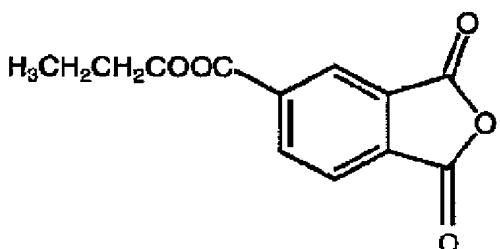
[Formula 11]



[0058] The photopolymer constituent was prepared like the example 1 of preparation except having come out and having added the compound 1 weight section expressed.

[0059] m-cresol and p-cresol are mixed by the weight ratio 20:80. (Example 7 of preparation) In the cresol novolak resin (weight average molecular weight 4,000) 90 weight section which added formaldehyde to this under oxalic acid catalyst existence, and was manufactured with the conventional method The addition of an one mol of 2, 3, 4, and 4'-tetra-hydroxy benzophenones, a naphthoquinone -1, and two mols [ of 2-diazido-5-sulfonyl chloride ] esterification resultant Nine weight sections, The lactic-acid propyl 100 weight section, the ethylene glycol monomethyl ether acetate 50 weight section, and following-izing 12 [0060]

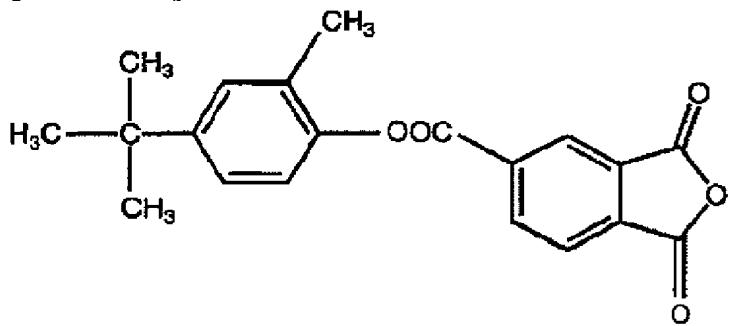
[Formula 12]



[0061] It came out, the compound 1 weight section expressed was added, and the photopolymer constituent was prepared.

[0062] (Example 8 of preparation) It is the following-ization 13 [0063] instead of the compound 1 weight section which makes the addition of cresol novolak resin 50 weight sections, makes the addition of an one mol of 2, 3, 4, and 4'-tetra-hydroxy benzophenones, a naphthoquinone -1, and two mols [ of 2-diazido-5-sulfonyl chloride ] esterification resultant 50 weight sections in the example 1 of preparation, and is further expressed with the above-ization 10.

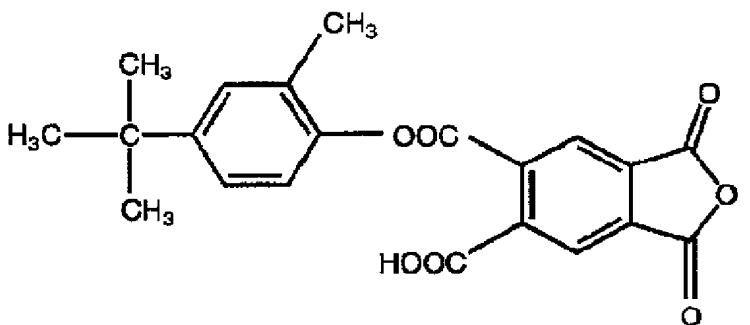
[Formula 13]



[0064] The photopolymer constituent was prepared like the example 1 of preparation except having come out and having added the compound 1 weight section expressed.

[0065] m-cresol and p-cresol are mixed by the weight ratio 40:60. (Example 9 of preparation) In the cresol novolak resin (weight average molecular weight 7,500 [ about ]) 50 weight section which added formaldehyde to this under existence of an oxalic acid catalyst, and was manufactured with the conventional method 2, the 4-Bisto RIKURORO methyl-6-(4-methoxy) styryl-s-triazine 10 weight section, the N-methoxy methylol melamine 40 weight section, the lactic-acid propyl 120 weight section, the ethylene-glycol-monomethyl-ether 30 weight section, and following-izing 14 [0066]

[Formula 14]

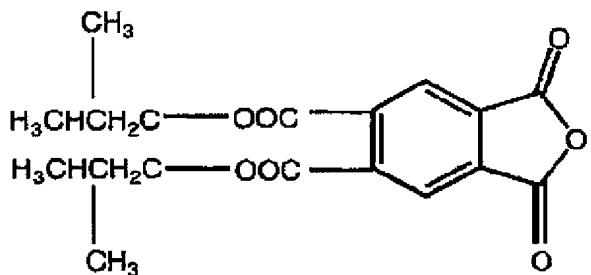


[0067] It came out, the compound 1 weight section expressed was added, and the photopolymer constituent was prepared.

[0068] m-cresol and p-cresol are mixed by the weight ratio 30:70. (Example 10 of preparation) In the cresol novolak resin (weight average molecular weight 5,500 [ about ]) 55 weight section which added formaldehyde to this under existence of an oxalic acid catalyst, and was manufactured with the conventional method 2, the 4-Bisto RIKURORO methyl-6-(4-methoxy) phenyl-s-triazine 15 weight section, the N-methoxy methylol melamine 30 weight section, the butyl lactate 60 weight section, the ethylene-glycol-monomethyl-ether 90 weight section, and following-izing 15

[0069]

[Formula 15]

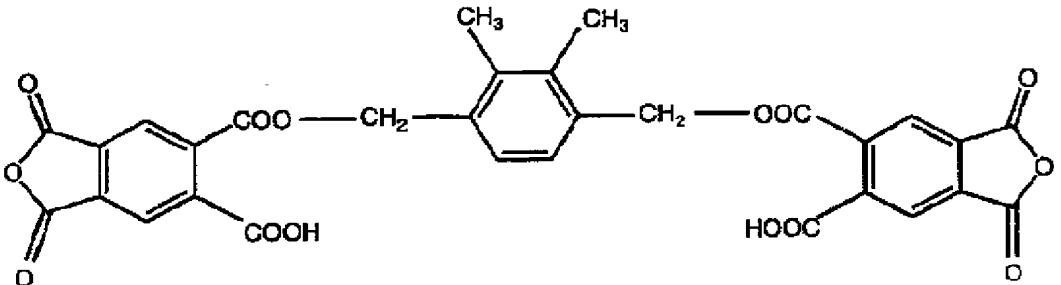


[0070] It came out, the compound 1 weight section expressed was added, and the photopolymer constituent was prepared.

[0071] m-cresol and p-cresol are mixed by the weight ratio 20:80. (Example 11 of preparation) In the cresol novolak resin (weight average molecular weight 7,500 [ about ]) 95 weight section which added formaldehyde to this under existence of an oxalic acid catalyst, and was manufactured with the conventional method 2, the 4-Bisto RIKURORO methyl-6-(4-methoxy) phenyl-s-triazine 1 weight section, the N-methoxy methylol melamine 3 weight section, the methyl lactate 75 weight section, the ethylene-glycol-monomethyl-ether 75 weight section, and following-izing 16

[0072]

[Formula 16]



[0073] It came out, the compound 1 weight section expressed was added, and the photopolymer constituent was prepared.

[0074] A methacrylic acid / methyl methacrylate / benzyl acrylate = (Example 12 of preparation) In 20/60 / 20 copolymer (weight average molecular weight 45,000 [ about ]) 75 weight section 2 The 4-Bisto RIKURORO methyl-6-(4-methoxy) phenyl-s-triazine 1 weight section, The amount section of 2-methyl-1-[4-(methylthio) phenyl]-2-morpholino propane-1-ON 2, The trimethylolpropane triacrylate 22 weight section, the propylene KURIKORU monomethyl ether 170 weight section, and the compound 1 weight section expressed with \*\* 10 used in the example 1 of preparation were added, and the photopolymer

constituent was prepared.

[0075] On a front face, a 0.5-micrometer ITO circuit pattern, (Examples 1-12, example 1 of a comparison) A layer insulation layer pattern and the molybdenum film prepare the glass substrate (10cmx10cmx0.7mm) by which laminating formation was carried out one by one. After applying with a spinner the photopolymer constituent for positive types prepared in the examples 1-4 of preparation so that it may become 2 micrometers of thickness, respectively, In an air heater, make it dry for 2 minutes and then 100 degrees C of ultrahigh pressure mercury lamps are used through the test mask pattern of 10-micrometer Rhine / 10-micrometer tooth space. About 25 mJ/cm<sup>2</sup> and the example 12 of preparation, it exposed [ 8 / the examples 1-3 of preparation, and / 5-8 / examples / 50 mJ/cm / 2 / and / of preparation / 4, 9-11 ] with the light exposure of 300 mJ/cm<sup>2</sup>.

[0076] Negatives were developed by having been immersed for 1 minute after exposure and into 2.38% tetramethylammonium hydroxide water solution, and 120 degrees C was dried for 5 minutes in the air heater. At this time, the substrate with which the resist pattern was obtained A-1 (the example 1 of preparation use; example 1), B-1 (the example 2 of preparation use; example 1 of a comparison), A-2 (the example 3 of preparation use; example 2), A-3 (the example 4 of preparation use; example 3), A-4 (the example 5 of preparation use; example 4), A-5 (the example 6 of preparation use; example 5), A-6 (the example 7 of preparation use; example 6), It is referred to as A-7 (the example 8 of preparation use; example 7), A-8 (the example 9 of preparation use; example 8), A-9 (the example 10 of preparation use; example 9), A-10 (the example 11 of preparation use; example 10), and A-11 (the example 12 of preparation use; example 11).

[0077] Subsequently, the molybdenum film was alternatively etched into the substrate which the molybdenum film exposed by being immersed for 10 minutes as an etching reagent into the 2nd ammonium of perchloric acid/cerium nitrate / water (3:1:16-fold quantitative ratio) solution. The resist pattern was exfoliated with the sodium-hydroxide water solution 4% after that, and the electric conduction pattern was formed on the glass substrate. It observed about the open circuit of the obtained pattern and the short circuit. A result is shown in Table 1.

[0078] Moreover, the preservation stability of each positive-resist constituent solution prepared by the examples 1-4 of preparation was evaluated. A result is shown in Table 1.

[0079]

[Table 1]

基板	断線	短絡	保存安定性(日)
A-1 (実施例1)	○	○	32
B-1 (比較例1)	×	×	32
A-2 (実施例2)	○	○	27
A-3 (実施例3)	○	○	24
A-4 (実施例4)	○	○	25
A-5 (実施例5)	○	○	26
A-6 (実施例6)	○	○	24
A-7 (実施例7)	○	○	25
A-8 (実施例8)	○	○	22
A-9 (実施例9)	○	○	23
A-10 (実施例10)	○	○	22
A-11 (実施例11)	○	○	18

The [evaluation approach of an open circuit and a short circuit] The sink and the continuity check were performed for the current to the obtained molybdenum film pattern after resist pattern exfoliation.

[0080] Open-circuit O: An open circuit is x which was not seen. : Short circuit O the open circuit was accepted to be to the part: A short circuit is x which was not seen. : The photopolymer constituent obtained in the examples 1-12 of the [evaluation approach of preservation stability] preparation the short circuits were accepted to be to the part was left all over the 40-degree C thermostatic chamber, the acceleration passage-of-time test was performed, and time amount was investigated until it generated in particle.

[0081]

[Effect of the Invention] As explained in full detail above, by this invention, in the pattern formation of the liquid crystal panel especially using a glass substrate, or a printed wired board, the open circuit and short circuit of a substrate by peeling of a resist pattern can be beforehand prevented by the ability raising adhesion with a substrate at the time of etching, moreover, it can exfoliate easily at the time of exfoliation, and the photopolymer constituent in which development is possible is obtained with the alkali water solution which does not carry out the reattachment to a substrate.

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[Translation done.]